

We claim:

1 1. A method for protecting a material from ant infestation, comprising treating the material with  
2 an effective amount of a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3 zizanol, and bicyclovetivenol, wherein the treated material repels or kills ants substantially more  
4 than does an otherwise identical material that has not been treated with the compound.

1 2. A method as in Claim 1, wherein the ants are fire ants.

3 3. A method as in Claim 1, wherein the treated material repels ants.

4 4. A method as in Claim 1, wherein the treated material kills ants.

1 5. A method as in Claim 1, wherein the material is selected from the group consisting of soil,  
2 synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1 6. A method as in Claim 1, wherein the compound is nootkatone.

- 1 7. A method as in Claim 1, wherein the compound is  $\alpha$ -cedrene.
- 1 8. A method as in Claim 1, wherein the compound is zizanol.
- 1 9. A method as in Claim 1, wherein the compound is bicyclovetivenol.
10. A method as in Claim 1, additionally comprising treating the material with one or more additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and bicyclovetivenol.
11. A protective barrier against ant infestation, said barrier comprising an effective amount of a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and bicyclovetivenol, and a substrate, wherein said barrier repels or kills ants substantially more than does an otherwise identical barrier that has not been treated with said compound.
- 1 12. A composition as in Claim 11, wherein the ants are fire ants.

1    13.    A composition as in Claim 11, wherein said substrate comprises a mulch.

1    14.    A composition as in Claim 13, wherein said mulch comprises dried vetiver grass.

1    15.    A composition as in Claim 13, wherein said mulch comprises cellulose-containing material.

1    16.    A composition as in Claim 11, wherein said substrate comprises soil.

1    17.    A composition as in Claim 11, wherein said substrate comprises diatomaceous earth.

1    18.    A composition as in Claim 11, wherein said compound is nootkatone.

1    **19.**    A composition as in Claim 18, wherein the concentration of nootkatone in said barrier is  
2    between about 10  $\mu\text{g/g}$  and about 1000  $\mu\text{g/g}$ .

1    **20.**    A composition as in Claim 18, wherein the concentration of nootkatone in said barrier is  
2    between about 10  $\mu\text{g/g}$  and about 200  $\mu\text{g/g}$ .

1    **21.**    A composition as in Claim 11, wherein said compound is zizanol.

1    **22.**    A composition as in Claim 11, wherein said compound is bicyclovetivenol.

1    **23.**    A composition as in Claim 11, wherein said compound is  $\alpha$ -cedrene.

1    **24.**    A composition as in Claim 11, additionally comprising treating said substrate with a one or  
2    more additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3    zizanol and bicyclovetivenol.

1   **25.**    A method for protecting a material from tick infestation, comprising treating the material  
2   with an effective amount of a compound selected from the group consisting of nootkatone,  $\alpha$ -  
3   cedrene, zizanol, and bicyclovetivenol, wherein the treated material repels or kills ticks substantially  
4   more than does an otherwise identical material that has not been treated with the compound.

1   **26.**    A method as in Claim 25, wherein the treated material repels ticks.

1   **27.**    A method as in Claim 25, wherein the treated material kills ticks.

1   **28.**    A method as in Claim 25, wherein the material is selected from a group consisting of soil,  
2   synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1   **29.**    A method as in Claim 25, wherein the compound is nootkatone.

1   **30.**    A method as in Claim 25, wherein the compound is  $\alpha$ -cedrene.

1    **31.**    A method as in Claim 25, wherein the compound is zizanol.

1    **32.**    A method as in Claim 25, wherein the compound is bicyclovetivenol.

1    **33.**    A method as in Claim 25, additionally comprising treating the material with one or more  
2 additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3 zizanol, and bicyclovetivenol.

1    **34.**    A protective barrier against tick infestation, said barrier comprising an effective amount of  
2 a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and  
3 bicyclovetivenol, and a substrate, wherein said barrier repels or kills ticks substantially more than  
4 does an otherwise identical barrier that has not been treated with said compound.

1    **35.**    A composition as in Claim 34, wherein said substrate comprises a mulch.

1    **36.**    A composition as in Claim 35, wherein said mulch comprises dried vetiver grass.

1    **37.**    A composition as in Claim 35, wherein said mulch comprises cellulose-containing material.

1    **38.**    A composition as in Claim 34, wherein said substrate comprises soil.

1    **39.**    A composition as in Claim 34, wherein said substrate comprises diatomaceous earth.

1    **40.**    A composition as in Claim 34, wherein said compound is nootkatone.

1    **41.**    A composition as in Claim 40, wherein the concentration of nootkatone in said barrier is  
2    between about 10  $\mu\text{g/g}$  and about 1000  $\mu\text{g/g}$ .

1 42. A composition as in Claim 40, wherein the concentration of nootkatone in said barrier is  
2 between about 10  $\mu\text{g/g}$  and about 200  $\mu\text{g/g}$ .

1 43. A composition as in Claim 34, wherein said compound is zizanol.

1 44. A composition as in Claim 34, wherein said compound is bicyclovetivenol.

1 45. A composition as in Claim 34, wherein said compound is  $\alpha$ -cedrene.

1 46. A composition as in Claim 34, additionally comprising treating the substrate material with  
2 a one or more additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -  
3 cedrene, zizanol and bicyclovetivenol.

1 47. A topical composition for application to the skin or fur of a mammal for protection against  
2 ticks, said composition comprising an effective amount of a compound selected from the group  
3 consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and bicyclovetivenol, and a pharmaceutically accepted  
4 carrier, wherein said composition when applied topically repels or kills ticks substantially more than  
5 does an otherwise identical composition that lacks the compound.



- 1    **48.**    A composition as in Claim 47, wherein said compound is nootkatone.
- 1    **49.**    A composition as in Claim 48, wherein the concentration of nootkatone in said composition  
2    is between about 10  $\mu\text{g/g}$  and about 1000  $\mu\text{g/g}$ .
- 1    **50.**    A composition as in Claim 48, wherein the concentration of nootkatone in said composition  
2    is between about 10  $\mu\text{g/g}$  and about 200  $\mu\text{g/g}$ .
- 1    **51.**    A composition as in Claim 47, wherein said compound is zizanol.
- 1    **52.**    A composition as in Claim 47, wherein said compound is bicyclovetivenol.
- 1    **53.**    A composition as in Claim 47, wherein said compound is  $\alpha$ -cedrene.

1 **54.** A composition as in Claim 47, additionally comprising a composition with a one or more  
2 additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol  
3 and bicyclovetivenol.

1 **55.** A method for protecting a material from cockroach infestation, comprising treating the  
2 material with an effective amount of a compound selected from the group consisting of nootkatone,  
3  $\alpha$ -cedrene, zizanol, and bicyclovetivenol, wherein the treated material repels cockraches substantially  
4 more than does an otherwise identical material that has not been treated with the compound.

1 **56.** A method as in Claim 55, wherein the material is selected from the group consisting of soil,  
2 synthetic polymers, diatomaceous earth, sand, and cellulose-containing materials.

1 **57.** A method as in Claim 55, wherein the compound is nootkatone.

1 **58.** A method as in Claim 55, wherein the compound is  $\alpha$ -cedrene.

1 **59.** A method as in Claim 55, wherein the compound is zizanol.

- 1 60. A method as in Claim 55, wherein the compound is bicyclovetivenol.
- 1 61. A method as in Claim 55, additionally comprising treating the material with one or more  
2 additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -cedrene,  
3 zizanol, and bicyclovetivenol.
- 4 62. A protective barrier against cockroach infestation, said barrier comprising an effective  
amount of a compound selected from the group consisting of nootkatone,  $\alpha$ -cedrene, zizanol, and  
bicyclovetivenol, and a substrate, wherein said barrier repels cockroaches substantially more than  
does an otherwise identical barrier that has not been treated with said compound.
- 6 63. A composition as in Claim 62, wherein said substrate comprises a mulch.
- 1 64. A composition as in Claim 63, wherein said mulch comprises dried vetiver grass.
- 1 65. A composition as in Claim 63, wherein said mulch comprises cellulose-containing material.

1 66. A composition as in Claim 62, wherein said substrate comprises soil.

1 67. A composition as in Claim 62, wherein said substrate comprises diatomaceous earth.

1 68. A composition as in Claim 62, wherein said compound is nootkatone.

1 69. A composition as in Claim 68, wherein the concentration of nootkatone in said barrier is  
2 between about 10  $\mu\text{g/g}$  and about 1000  $\mu\text{g/g}$ .

1 70. A composition as in Claim 68, wherein the concentration of nootkatone in said barrier is  
2 between about 10  $\mu\text{g/g}$  and about 200  $\mu\text{g/g}$ .

1 71. A composition as in Claim 62, wherein said compound is zizanol.

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1    **72.**    A composition as in Claim 62, wherein said compound is bicyclovetivenol.

1    **73.**    A composition as in Claim 62, wherein said compound is  $\alpha$ -cedrene.

1    **74.**    A composition as in Claim 62, additionally comprising treating the substrate material with  
a one or more additional, different compounds selected from the group consisting of nootkatone,  $\alpha$ -  
cedrene, zizanol and bicyclovetivenol.